

REMARKS

The claims have not been amended and therefore no new matter has been added. Upon entry of this amendment, claims 1-39 are present and active in the application.

Applicants wish to thank Examiner Lamprecht for the courteous and helpful interview held with Applicants' representatives on February 7, 2008. During the interview, the term "reference" as used in Claim 1 was discussed along with the cited reference.

REQUEST FOR RECONSIDERATION

The ability to measure the three-dimensional structure of biological tissues is important, but common methods leave out basic information about the molecular composition and metabolic behavior of the tissue imaged. Molecular composition and metabolic behavior information may yield valuable scientific data on the behavior of biological systems, and would be of great clinical diagnostic value for finding diseases, such as cancer. Much of the focus of biological and medical imaging today is to gain information about composition.

Applicants have discovered that nonlinear interferometric vibrational imaging (NIVI) can be used to measure the three-dimensional distribution of molecular species in various samples (biological or otherwise). Its basic operation is to stimulate the excitation of molecular bonds with particular resonance frequencies, and then use these excitations to produce radiation distinct from the excitation. The physical process of excitation and stimulation of radiation is called Coherent Anti-Stokes Raman Scattering (CARS). Unlike previous methods that use CARS in microscopy to probe for the presence of molecular species, NIVI utilizes a heterodyne approach where a reference signal is separately generated from a medium, or reference, and interferometrically compared to the signal received from the sample, allowing the signal to be formed into an image in the same way as optical coherence tomography (OCT). In this way, additional information can be inferred from the emitted radiation such as the distance to the sample.

Claim 1 recites a method of examining a sample. The method includes exposing *a reference* to a *first set* of electromagnetic radiation to form a *second set* of electromagnetic radiation scattered from the reference. At least a portion of the second set of electromagnetic radiation is of a frequency *different* from that of the first set of electromagnetic radiation. The reference may be either a sample of a target molecule, a solvent, or a continuum generation medium. (See the specification, page 21, lines 28-29) Applicants would be happy to clarify the term “reference” in the claims if the Examiner so requests.

The rejection of claims 1-39 under 35 U.S.C. § 102(b) as allegedly being anticipated by Izatt et al. (U.S. Patent No. 6,002,480) is respectfully traversed. Izatt et al. fails to teach or disclose a reference which forms a second set of electromagnetic radiation, at least a portion of which is of a frequency different from that of a first set of electromagnetic radiation.

Izatt et al. discusses a technique for depth-resolved coherent backscatter spectroscopy which is an extension of OCT technology. Izatt et al. also discusses that a conventional scanning Michelson interferometer can be utilized to obtain the depth resolved measurements of reflectors and scatterers in a sample. (See Izatt et al., col. 5, lines 53-55) A low coherence light source 10 is separated into two beams by a 50/50 beam splitter 16, fifty percent of the light power is transmitted to a sample arm 12 and the remaining fifty percent is directed to a reference arm 14. (See Izatt et al., col. 5, lines 55-59) The reference arm 14 includes a reference probe 22 which transmits the reference beam onto a retroreflecting *mirror* 24, translating towards or away from the reference probe, and collects the light retroreflected back from the *mirror* 24. (See Izatt et al., col. 5, lines 62-66) Since a mirror reflects light, there will be no change in frequency between the electromagnetic energy hitting the mirror 24 and the electromagnetic energy reflected from the mirror 24.

Claim 1 specifies exposing *a reference* to a *first set* of electromagnetic radiation to form a *second set* of electromagnetic radiation scattered from the reference, wherein at least a portion of the second set of electromagnetic radiation is of a frequency *different* from that of the first set of electromagnetic radiation. There is no teaching or suggestion in Izatt et al. that electromagnetic energy formed by the reference arm 14 is

of a frequency different from electromagnetic energy exposed to the reference arm 14, since Izatt et al. uses a mirror. Accordingly, Applicants submit that the present invention is neither anticipated by, nor obvious over, Izatt et al. Withdrawal of this ground of rejection is respectfully requested.

Applicants submit that the application is now condition for allowance. Early notice of such action is earnestly solicited.

Respectfully submitted,



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